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EXAMINER	
FLORES RUIZ, DELMA R	
ART UNIT	**PAPER NUMBER**
2828	

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/090,146	IKEDA, CHIKAHO
	Examiner	Art Unit
	Delma R. Flores Ruiz	2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-8 and 10-33* is/are rejected.

7)☒ Claim(s) *3 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 May 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/22/2004*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *05/05/2004* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 – 2, 4 – 5 and 14 – 33 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakuragi (6,222,357).

Regarding claim 1, Sakuragi discloses an apparatus for driving a light emitting element in response to input data, the light emitting element caused to emit light by flowing a direct current, the apparatus comprising: a voltage source (see Figs. 1 and 2, Character 5); and a switching section (see Figs. 1and 2 Character S1 – S4) disposed between the voltage source and the light emitting element (see Figs. 1 and 2 Characters D1 and D2) and controlled on a basis of the input data (Abstract), wherein a resistance value from an output end of the

voltage source to a drive end of the light emitting element is smaller than an internal resistance value of the light emitting element; and wherein a current flowing into the voltage source is smaller than a current flowing into the light emitting element (see Figs 1 and 2, Abstract, Column 3, Lines 13 – 24, Column 4, Lines 6 – 11, 19 – 31, and 44 – 67, Column 5, Lines 1 – 2, and 60 – 67 and Column 6, Lines 1 – 8, 16 – 26, and 41 – 45).

Regarding claim 2 Sakuragi discloses a voltage source has a negative feedback loop that negatively feeds back an output and a buffer amplifier that amplifies an predetermined input voltage (see Figs 1 – 2, Column 4, Lines 6 – 11, 19 – 31, and 44 – 67, Column 5, Lines 1 – 2, and 60 – 67 and Column 6, Lines 1 – 8, 16 – 26, and 41 – 45).

Regarding claim 4, Sakuragi discloses the switching section changes an output voltage of the voltage source and a biasing voltage to bias the light emitting element on a basis of the input data (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a switching section changes an output voltage of the voltage source and a biasing voltage to bias the light emitting element on a basis of the input data, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 5 Sakuragi discloses an input side retaining section for retaining control voltage when controlling optical power at an input side of the buffer amplifier (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a an input side retaining section for retaining control voltage when controlling optical power at an input side of the buffer amplifier, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 14 Sakuragi discloses an apparatus for driving a light emitting element in response to input data, the light emitting element emitting light by causing a direct current to flow thereto, the apparatus comprising: a voltage driving section (see Figs. 1 and 2, Character 5) for driving the light emitting element (see Fig. 1, Characters D1 and D2) with voltage; a current driving section for driving the light emitting element with a current; and a switching section (see Fig 1. Characters S1 – S4) for changing voltage drive by the voltage driving section and current drive by the current driving section based on the input data (see Figs 1 – 2, Abstract, Column 5, Lines 8 – 29).

Regarding claim 15 Sakuragi discloses the input data are pulse data, and wherein the switching section changes to the voltage drive by the voltage driving section in at least one of periods of rise and fall of the pulse data (said limitation only recites facts and features that are well known and expected, the same

features that essentially result from the use or application of a the input data are pulse data, and wherein the switching section changes to the voltage drive by the voltage driving section in at least one of periods of rise and fall of the pulse data, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 16 Sakuragi discloses the switching section (see Fig. 1, Characters S1 – S4) is able to simultaneously select the voltage drive by the voltage driving section and the current drive by the current driving section; and wherein the switching section simultaneously selects the current drive by the current driving section when being changed to the voltage drive by the voltage driving section to supply a current by the current drive to the light emitting element (see Figs 1 – 2, Abstract, Column 5, Lines 8 – 29).

Regarding claim 17 Sakuragi discloses the voltage driving section includes a bias voltage applying section for applying bias voltage to the light emitting element; and wherein the switching section changes to the voltage drive by the voltage driving section in the period of rise of the pulse data, subsequently changes to the current drive by the current driving section, and thereafter changes to voltage drive by the bias voltage applying section in the period of fall of the pulse data (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or

application of a switching section changes to the voltage drive by the voltage driving section in the period of rise of the pulse data, subsequently changes to the current drive by the current driving section, and thereafter changes to voltage drive by the bias voltage applying section in the period of fall of the pulse data, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 18 Sakuragi discloses the voltage driving section includes a buffer section for amplifying an input voltage and an output side retaining section for retaining voltage corresponding to an output voltage of the buffer section at an output side of the buffer section; and wherein the switching section supplies the voltage retained by the output side retaining section to the light emitting element (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a buffer section for amplifying an input voltage and an output side retaining section for retaining voltage corresponding to an output voltage of the buffer section at an output side of the buffer section; and wherein the switching section supplies the voltage retained by the output side retaining section to the light emitting element, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

R g rding claim 19 Sakuragi discloses the voltage driving section includes an input side retaining section for retaining voltage corresponding to a control voltage when controlling optical power at the input side of the buffer section (see Figs. 1 - 5).

Regarding claim 20 Sakuragi discloses the current driving section includes a retaining section for retaining a voltage corresponding to the output voltage of the buffer section and a constant current source for outputting a current corresponding to the voltage retained by the retaining section; and wherein the switching section supplies a current outputted from the constant current source to the light emitting element (see Figs 1 – 5),

Regarding claims 21 and 28 Sakuragi discloses a compensating section for compensating a voltage of at least one of rise and fall of the pulse data, corresponding to a fluctuation in temperature of the light emitting element (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a compensating section for compensating a voltage of at least one of rise and fall of the pulse data, corresponding to a fluctuation in temperature of the light emitting element, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

R garding claim 22 Sakuragi discloses the compensating section detects a terminal voltage of the light emitting element and compensates the voltage on a basis of the detection result (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a compensating section detects a terminal voltage of the light emitting element and compensates the voltage on a basis of the detection result, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 23 Sakuragi discloses the voltage driving section (see Fig. 1, Character 5) includes a bias voltage applying section for applying a bias voltage to the light emitting element (see Fig. 1, Characters D1 and D2); wherein the current driving section includes a bias current supplying section for outputting a bias current corresponding to the bias voltage; and wherein the switching section (see Fig. 1, Characters S1 – S4) changes to the voltage drive by the voltage driving section in the period of rise of the pulse data (Abstract), thereafter changes to the current drive by the current driving section, subsequently changes to the voltage drive by the bias voltage applying section in the period of fall of the pulse data, and changes to the current drive by the bias current supplying section in a period of OFF of the pulse data to supply the bias current to the light emitting element (see Figs 1 – 2, Abstract, Column 5, Lines 8 – 29, and 45 – 59).

R garding claim 24 Sakuragi discloses the voltage driving section includes: a buffer section for amplifying an input voltage; an output side retaining section for retaining a voltage corresponding to the output voltage of the buffer section at the output side of the buffer section; and an input side retaining section for retaining a voltage corresponding to the control voltage when controlling optical power at the input side of the buffer section; wherein the switching section supplies the voltage retained by the output side retaining section to the light emitting element; and wherein the compensating section detects a terminal voltage of the light emitting element and compensates the retaining voltage of the input side retaining section on a basis of the detection result (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a input side retaining section for retaining a voltage corresponding to the control voltage when controlling optical power at the input side of the buffer section; wherein the switching section supplies the voltage retained by the output side retaining section to the light emitting element; and wherein the compensating section detects a terminal voltage of the light emitting element and compensates the retaining voltage of the input side retaining section on a basis of the detection result, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

R garding claims 25 - 26, Sakuragi discloses the compensating section has a detecting section for detecting the terminal voltage of the light emitting element; and wherein the compensating section compensates the retaining voltage of the input side retaining section on a basis of the detection result of the detection section and a period of the voltage drive by the voltage driving section is less than the minimum pulse width of the pulse data (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a the compensating section has a detecting section for detecting the terminal voltage of the light emitting element; and wherein the compensating section compensates the retaining voltage of the input side retaining section on a basis of the detection result of the detection section and a period of the voltage drive by the voltage driving section is less than the minimum pulse width of the pulse data, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 27 Sakuragi discloses a period of the voltage drive by the voltage driving section is less than the minimum pulse width of the pulse data (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a period of the voltage drive by the voltage driving section is less than the minimum pulse width of the pulse data, and therefore said limitations are said to be inherently

disclosed in the teachings of Sakuragi).

Regarding claim 29 Sakuragi discloses the input side and output side retaining sections are capacitors (see Figs. 1 – 5).

Regarding claim 30 Sakuragi discloses a system for driving light emitting elements, the system comprising: a plurality of apparatus for driving the light emitting elements (see Fig. 1, Characters D1 and D2) in response to input data, the light emitting elements caused to emit light by flowing a direct current, the apparatus comprising: a voltage source (see Fig. 1, Character 5); and a switching section (see Fig. 1, Characters S1 – S4) disposed between the voltage source and the light emitting element and controlled on a basis of the input data (see Figs 1 – 2, Abstract, Column 5, Lines 8 – 29, and 45 – 59, a detecting section for detecting optical power of the plurality of light emitting elements; and a error amplifying section for comparing voltage corresponding to the detection result of the detecting section and a reference voltage to amplify the error therebetween; wherein a resistance value from an output end of the voltage source to a drive end of the light emitting element is smaller than an internal resistance value of the light emitting element; wherein a current flowing into the voltage source is smaller than a current flowing into the light emitting element; and wherein each of the plurality of apparatus for driving light emitting elements drives the light emitting element on a basis of outputs of the error amplifying

section (see Figs 1 – 2, Abstract, Column 5, Lines 8 – 29, and 45 – 59).

Regarding claims 31 and 33, Sakuragi discloses the error amplifying section includes: an error amplifier inputted the detection result of the detecting section and the reference voltage; and a plurality of negative feedback loops for negatively feeding back output of the error amplifier to inputs thereof, the negative feedback loops provided to corresponding number of the apparatuses for driving light emitting elements; wherein each of the plurality of negative feedback loops includes: a retaining section for retaining a voltage corresponding to the output voltage of the error amplifier when controlling the optical power of the light emitting elements; and a switching section connected to the retaining section in series; wherein each of the plurality of apparatus for driving light emitting elements has an input side retaining section for retaining the retaining voltage of the corresponding retaining section in the plurality of negative feedback loops; and wherein each of the plurality of apparatus for driving light emitting elements drives the light emitting element on a basis of the retaining voltage of the input side retaining section (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a error amplifier inputted the detection result of the detecting section and the reference voltage; and a plurality of negative feedback loops for negatively feeding back output of the error amplifier to inputs thereof, the negative feedback loops provided to corresponding number of the

apparatuses for driving light emitting elements; wherein each of the plurality of negative feedback loops includes: a retaining section for retaining a voltage corresponding to the output voltage of the error amplifier when controlling the optical power of the light emitting elements; and a switching section connected to the retaining section in series; wherein each of the plurality of apparatus for driving light emitting elements has an input side retaining section for retaining the retaining voltage of the corresponding retaining section in the plurality of negative feedback loops; and wherein each of the plurality of apparatus for driving light emitting elements drives the light emitting element on a basis of the retaining voltage of the input side retaining section, and therefore said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 32, Sakuragi discloses A system for driving light emitting elements, the system comprising: an apparatus for driving a light emitting element in response to input data, the light emitting element emitting light by causing a direct current to flow thereto, the apparatus comprising: a voltage driving section for driving the light emitting element with voltage; a current driving section for driving the light emitting element with a current; and a switching section for changing voltage drive by the voltage driving section and current drive by the current driving section based on the input data, a detecting section for detecting optical power of the plurality of light emitting elements; and a error amplifying section for comparing voltage corresponding to the detection

result of the detecting section and a reference voltage to amplify the error therebetween, wherein a resistance value from an output end of the voltage source to a drive end of the light emitting element is smaller than an internal resistance value of the light emitting element; wherein a current flowing into the voltage source is smaller than a current flowing into the light emitting element; and wherein each of the plurality of apparatus for driving light emitting elements drives the light emitting element on a basis of outputs of the error amplifying section (see Figs 1 and 2, Abstract, Column 3, Lines 13 – 24, Column 4, Lines 6 – 11, 19 – 31, and 44 – 67, Column 5, Lines 1 – 2, and 60 – 67 and Column 6, Lines 1 – 8, 16 – 26, and 41 – 45).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6 – 8, 10 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuragi (6,222,357) in view of Ema et al (5,036,519).

Regarding claims 6, and 12 Sakuragi discloses an apparatus for driving a laser element as a light emitting element in response to input data comprising: a first voltage source (see Fig. 1, Character 5) for causing the laser element to be a forward biasing state and generating a first voltage that is lower than a threshold voltage of laser oscillation; Sakuragi discloses the claimed invention except for a second voltage source for causing the laser element to be a forward biasing state and generating a second voltage that is larger than the threshold voltage of laser oscillation; and a switching section for changing the first voltage and the second voltage on a basis of the input data and applying the changed voltage directly to a drive end of the laser element, wherein a resistance value from an output end of the second voltage source and the drive end of the laser element is smaller than the internal resistance value of the laser element; and wherein a current flowing into the second voltage source is smaller than that flowing into the laser element. It would have been obvious at the time of applicant's invention, to combine Ema of teaching a second voltage, switching, etc with driving a laser element because it would have been obvious to one having ordinary skill in the art at the time the invention was made to a second voltage source for causing the laser element to be a forward biasing state and generating a second voltage that is larger than the threshold voltage of laser oscillation; and a switching section for changing the first voltage and the second voltage on a basis of the input data and applying the changed voltage directly to a drive end of the laser element, wherein a resistance value from an

output end of the second voltage source and the drive end of the laser element is smaller than the internal resistance value of the laser element; and wherein a current flowing into the second voltage source is smaller than that flowing into the laser element, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.

Regarding claim 7, Sakuragi discloses the laser element is a surface emitting laser element (see Fig. 1 – 2, Characters D1 and D2).

Regarding claim 8 Sakuragi discloses the surface emitting laser element includes a plurality of light emitting parts emitting a plurality of laser beams; and wherein the first voltage is commonly applied to at least two of the light emitting parts of the plurality of light emitting parts (see Figs 1 – 2).

Regarding claim 10 Sakuragi discloses input side retaining section for retaining control voltage when controlling optical power at an input side of the buffer amplifier (said limitation only recites facts and features that are well known and expected, the same features that essentially result from the use or application of a input-side retaining section for retaining control voltage when controlling optical power at an input side of the buffer amplifier, and therefore

said limitations are said to be inherently disclosed in the teachings of Sakuragi).

Regarding claim 11 Sakuragi discloses a current supplying section for supplying a compensation current, which compensates a fluctuation of an output current of the negative feedback amplifying circuit due to changing of the switching section, to the drive end of the laser element (see Figs 1 – 2).

Regarding claim 13 Sakuragi discloses the current supplying section includes a current source having an MOS transistor and an MOS switch connected between the current source and the drive end of the laser element; and wherein the MOS transistor of the current source and the MOS switch are formed of a dual gate MOS transistor (Abstract, Column 2, Lines 64 – 67, Column 3, Lines 1 – 45).

Allowable Subject Matter

Claims 3, and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is an examiner's statement of reasons for allowance: claims 3 and 9 have been

allowed over the prior art because they fail to teach the voltage source has a capacitance section at an output of the buffer amplifier; and wherein the capacitance section of the voltage source has greater capacitance than the capacitance value of parasitic capacitance of the light emitting element, when being observed from the switching section and wherein at least latter of the first and second voltage sources has: a negative feedback amplifying circuit having a buffer amplifier for amplifying an input voltage, the circuit for feeding back an output signal of the buffer amplifier to lower impedance of output of the buffer amplifier; and a capacitance section which has a larger capacitance value than the capacitance of parasitic capacitance of the laser element when being observed from the switching section and is connected to an output side of the buffer amplifier, and wherein a resistance value from the output of the buffer amplifier to the laser element is smaller than a differential resistance value of the laser element when the laser emits light.

Response to Arguments

Applicant's arguments filed 3/22/2004 have been fully considered but they are not persuasive. Applicant argues the prior art lacks: Sakuragi does not disclose, teach or suggest "a resistance value from an output end of the voltage source to a drive end of the light emitting element is smaller than an internal resistance value of the light emitting element" as recited in independent claims 1

and 30. The examiner disagree with the applicant arguments since the prior art does teach "a resistance value from an output end of the voltage source to a drive end of the light emitting element is smaller than an internal resistance value of the light emitting element", this limitations is a basic limitation circuit, and is inherent in the reference, (see Figs 1 and 2, Abstract, Column 3, Lines 13 – 24, Column 4, Lines 6 – 11, 19 – 31, and 44 – 67, Column 5, Lines 1 – 2, and 60 – 67 and Column 6, Lines 1 – 8, 16 – 26, and 41 – 45). as stated in the rejection above.

Applicant argues the prior art lacks: a voltage driving section for driving a light emitting element with voltage and a switching section for changing between a voltage drive by the voltage driving section and a current drive by the current driving section based on the input data" as recited in independent claims 14 and 32. The examiner disagree with the applicant arguments since the prior art does teach a voltage driving section for driving a light emitting element with voltage" (see Figs 1 and 2, Abstract, Column 3, Lines 13 – 24, Column 4, Lines 6 – 11, 19 – 31, and 44 – 67, Column 5, Lines 1 – 2, and 60 – 67 and Column 6, Lines 1 – 8, 16 – 26, and 41 – 45) as stated in the rejection above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Delma R. Flores Ruiz whose telephone number is (571) 272-1940. The examiner can normally be reached on M - F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on (571) -272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Delma R. Flores Ruiz
Examiner
Art Unit 2828
DRFR/DW
June 9, 2004

Don Wong
Supervisor Patent Examiner
Art Unit 2828